

CLAIMS

WHAT IS CLAIMED IS:

1 1. A method for managing charging and billing for services on a network
2 having one or more network elements providing billable services and one or more
3 charging elements; the method comprising:

4 receiving charging events at a network charging edge comprising one
5 or more bridge modules logically coupled between the network elements and the
6 charging elements; and

7 managing charging transactions between the network elements and
8 their respective charging elements via the one or more bridge modules through the
9 application of rules to the charging transaction initiated by corresponding charging
10 events.

1 2. The method as in Claim 1, further comprising generating and
2 transmitting the charging events by the network elements providing the billable
3 services, wherein the charging events comprise service use parameters used by the
4 charging elements.

1 3. The method as in Claim 1, further comprising implementing an
2 application programming interface (API) at each of the network elements providing
3 billable services to interface each of the respective network elements to the one or
4 more bridge modules.

1 4. The method as in Claim 3, further comprising generating and
2 transmitting the charging events by the network elements providing the billable
3 services, wherein transmitting the charging events comprises transmitting XML
4 charging events pursuant to the API.

1 5. The method as in Claim 1, wherein receiving charging events
2 comprises intercepting the charging events dispatched by the network elements to
3 the charging elements.

1 6. The method as in Claim 1, wherein managing charging transactions
2 comprises applying the rules to transform the charging events to a format
3 recognizable by targeted charging elements.

1 7. The method as in Claim 6, wherein applying the rules to transform the
2 charging events comprises converting the charging events from a first format to a
3 second format.

1 8. The method as in Claim 6, wherein applying the rules to transform the
2 charging events comprises filtering the charging events to prevent transmission of
3 particular ones of the charging events to the charging elements.

1 9. The method as in Claim 6, wherein applying the rules to transform the
2 charging events comprises recalculating fields of the charging events to present the
3 fields in units utilized in the charging elements.

1 10. The method as in Claim 6, wherein applying the rules to transform the
2 charging events comprises routing the charging events to multiple destinations.

1 11. The method as in Claim 6, further comprising transmitting the
2 transformed charging events via interface objects corresponding to respective
3 charging elements.

1 12. The method as in Claim 11, further comprising directing the
2 transformed charging events to the interface objects corresponding to targeted
3 charging elements based on the rules and the transformed charging events.

1 13. The method as in Claim 12, wherein directing the transformed
2 charging events further comprises applying the rules to the transformed charging
3 events to identify addresses of the interface objects corresponding to the targeted
4 charging elements.

1 14. The method as in Claim 1, wherein managing charging transactions
2 comprises selecting an interface object for communicating with a corresponding
3 charging element, wherein selecting an interface object comprises identifying one of
4 a plurality of the interface objects as determined by object configuration rules.

1 15. The method as in Claim 1, wherein managing charging transactions
2 comprises performing a plurality of transaction operations with a plurality of the
3 charging elements in a sequence dictated by the rules.

1 16. The method as in Claim 15, wherein performing a plurality of
2 transaction operations with a plurality of the charging elements comprises applying
3 the rules to responsive messages from at least one of the charging elements to
4 perform one or more of the transaction operations.

1 17. The method as in Claim 1, wherein managing charging transactions
2 comprises coordinating one or more communications with the charging elements to
3 carry out the charging transaction.

1 18. The method as in Claim 17, wherein coordinating the communications
2 with the charging elements comprises transmitting a first call to a first charging
3 element in response to applying the rules to the charging transaction initiated by the
4 corresponding charging event.

1 19. The method as in Claim 18, wherein coordinating the communications
2 with the charging elements further comprises receiving a response to the first call
3 from the first charging element, and transmitting a second call to a second charging
4 element in response to applying the rules to the response to the first call.

1 20. The method as in Claim 1, further comprising configuring the one or
2 more bridge modules with the rules.

1 21. The method as in Claim 20, wherein configuring the bridge modules
2 with the rules comprises configuring each of the bridge modules with a subset of the
3 rules assigned to the services managed by that bridge module.

1 22. The method as in Claim 21, wherein a plurality of the bridge modules
2 are implemented at the network charging edge, and further comprising designating
3 one of the bridge modules as a primary bridge module to receive all of the rules for
4 all of the bridge modules.

1 23. The method as in Claim 22, further comprising distributing the subsets
2 of rules from the primary bridge module to remaining bridge modules.

1 24. The method as in Claim 22, further comprising entering the rules at a
2 console coupled to the primary bridge module.

1 25. A system for facilitating charging for services available via a network,
2 comprising:

3 at least one network charging element to perform service charging
4 functions;

5 at least one network service element to provide at least one service
6 subject to use charges; and

7 a network charging edge comprising at least one charging bridge
8 logically coupled between the network service element and the network charging
9 element to mediate communications between the network service element and the
10 network charging element.

1 26. The system as in Claim 25, wherein the charging bridge comprises a
2 transformation module to receive a charging event from the network service element

3 and to transform the charging event to a native format of the network charging
4 element.

1 27. The system as in Claim 26, wherein the charging bridge further
2 comprises business rule modules coupled to the transformation module to govern
3 transformations of the transformation module in accordance with predefined
4 business rules.

1 28. The system as in Claim 27, wherein the charging bridge further
2 comprises:
3 an interface object module comprising a plurality of interface objects
4 for communicating with a respective plurality of the network charging elements;
5 an interface object management module coupled to the transformation
6 module to receive transformed charging events; and
7 object configuration rule modules coupled to the interface object
8 management module to instruct the interface object management module to direct
9 the transformed charging events to the interface objects of the network charging
10 elements for which the transformed charging events are destined.

1 29. The system as in Claim 25, wherein each of the network service
2 elements comprise an application programming interface (API) to interface each
3 respective network service element to the charging bridge.

1 30. The system as in Claim 25, wherein the network charging element
2 comprises a network server that ascertains the use charges applicable to a
3 subscriber's use of the service.

1 31. The system as in Claim 25, wherein the network charging element
2 comprises a network server that generates an invoice applicable to a subscriber's
3 use of the service.

1 32. The system as in Claim 25, wherein the network charging element
2 comprises at least one of a charging and billing system, a rating engine, and a
3 prepaid server.

1 33. A bridging apparatus for mediating charging transactions between at
2 least one network service element and at least one network charging element on a
3 network, comprising:
4 a transformation module to receive a charging event from the network
5 service element and to transform the charging event to a format comprehensible by
6 the network charging element;
7 a business rule module coupled to the transformation module to
8 provide predefined business rules to govern transformations performed by the
9 transformation module;
10 an interface object module comprising a plurality of interface objects
11 for communicating with a respective plurality of the network charging elements;
12 an interface object management module coupled to the transformation
13 module to receive transformed charging events; and
14 an object configuration rule module coupled to the interface object
15 management module to instruct the interface object management module to direct
16 the transformed charging events to the interface objects of the charging elements
17 for which the transformed charging events are destined.

1 34. The bridging apparatus as in Claim 33, wherein the transformation
2 module is an eXtensible Markup Language (XML) transformation module to
3 transform XML charging events.

1 35. A system for managing charging and billing for services on a network
2 having one or more network elements providing billable services and one or more
3 charging elements, the system comprising:

4 means for receiving charging events at a network charging edge
5 comprising one or more bridging means logically coupled between the network
6 elements and the charging elements; and
7 means for managing charging transactions between the network
8 elements and their respective charging elements via the one or more bridging
9 means through the application of rules to the charging transaction initiated by
10 corresponding charging events.

1 36. The system of Claim 35, further comprising means for interfacing each
2 of the respective network elements to the one or more bridging means.

1 37. The system of Claim 35, wherein the means for managing charging
2 transactions comprises means for transforming the charging events to a format
3 recognizable by targeted charging elements.

1 38. The system of Claim 37, further comprising means for transmitting the
2 transformed charging events to the charging elements.

1 39. The system of Claim 35, further comprising means for configuring the
2 one or more bridging means with the rules.

1 40. A computer-readable medium having computer-executable instructions
2 for managing charging and billing for services on a network having one or more
3 network elements providing billable services and one or more charging elements,
4 the computer-executable instructions performing steps comprising:
5 receiving charging events at a network charging edge comprising one
6 or more bridge modules logically coupled between the network elements and the
7 charging elements; and
8 managing charging transactions between the network elements and
9 their respective charging elements via the one or more bridge modules through the
10 application of rules to the charging transaction initiated by corresponding charging
11 events.

1 41. A method for managing charging and billing for services on a network
2 having one or more network elements providing billable services and one or more
3 charging elements; the method comprising:

4 receiving a plurality of charging information records generated by a
5 plurality of network elements at a network charging edge, wherein the plurality of
6 charging information records are associated with a user session involving each of
7 the plurality of network elements;

8 coordinating the charging information records into a user-session
9 charging transaction at one or more bridge modules of the network charging edge
10 logically coupled between the plurality of network elements and the charging
11 elements, wherein coordinating the charging information records into a user-session
12 charging transaction is governed by first predetermined rules applied at the one or
13 more bridge modules; and

14 executing the user-session charging transaction at the one or more
15 bridge modules of the network charging edge according to second predetermined
16 rules.

1 42. The method of Claim 41, wherein coordinating the charging
2 information records into a user-session charging transaction comprises determining
3 whether to include or exclude particular ones of the plurality of charging information
4 records into the user-session charging transaction.

1 43. The method of Claim 41, wherein coordinating the charging
2 information records into a user-session charging transaction comprises determining
3 whether to invoke a correlation module to correlate the plurality of charging
4 information records into one or more operations of the user-session charging
5 transaction.

1 44. The method of Claim 41, wherein coordinating the charging
2 information records into a user-session charging transaction comprises determining
3 whether to invoke a session management module to obtain session information

4 relating to the plurality of charging information records for use in one or more
5 operations of the user-session charging transaction.

1 45. The method of Claim 41, wherein executing the user-session charging
2 transaction comprises applying the second predetermined rules to transform the
3 user-session charging transaction to a format recognizable by targeted charging
4 elements.

1 46. The method of Claim 45, further comprising directing the transformed
2 user-session charging transaction to interface objects corresponding to targeted
3 charging elements based on third predetermined rules.

1 47. The method of Claim 41, wherein executing the user-session charging
2 transaction comprises selecting an interface object for communicating with a
3 corresponding charging element, wherein selecting an interface object comprises
4 identifying one of a plurality of the interface objects as determined by third
5 predetermined rules.

1 48. The method of Claim 41, wherein executing the user-session charging
2 transaction comprises controlling the operation and sequence of one or more
3 communications with the charging elements.